

# Memorandum



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DATE : May 20, 1977

TO : Pete Henault

FROM : Maura O'Neill *meo*

SUBJECT : PRELIMINARY REPORT OF THE ENVIRONMENTAL ANALYSIS OF PCB ALTERNATIVES

In accordance with the Toxic Substances Control Act of 1976, which identifies the persistence in the environment and the toxicity of PCBs, an environmental analysis of alternatives developed for PCBs is being done. It is our concern that any alternative chosen by City Light be environmentally suitable. Examination has been centered on three parameters: toxicity, bioaccumulation and biodegradability. The four dielectric fluids for power capacitors that are being examined include: WEMCOL (Westinghouse), Dielektrol II (General Electric), Selectrol I (Sangamo), and Edisol (Mc-Graw Edison/Dow Chemical).

Upon preliminary investigation, it became apparent that the majority if not all of the research on PCB alternatives has been done by the industry marketing the fluid. In attempting to locate additional information, I spoke with George Wirth of the regulation department at EPA's Office of Toxic Substances in Washington, D. C. His department is writing the proposed regulations for disposing of PCBs and an important question to them is how viable are the existing alternatives. On June 9, 1976, in the Federal Register, his office published their environmental analysis and recommendations on two alternative fluids.

Regarding the substitution of polydimethylsiloxane for PCBs in transformers, EPA said they were unaware of any incidents of adverse health or ecological effects associated with the production, use, or disposal of this fluid. This fluid has been produced in the U. S. at an estimated level of 340 million pounds for a variety of applications including some which result in substantial discharges into the environment. In addition, they stated that laboratory tests do not suggest the likelihood of environmental problems. However, they did caution that they do not know of any systematic epidemiological data and would like to see more data on chronic health and aquatic systems effects. At this time, EPA feels this fluid is far preferable to PCBs for use in transformers from the environmental standpoint.

Concerning the substitution of chloralkylene fluid, EPA stated that the data developed on the fluid was inadequate to assess the environmental acceptability of a product with a chemical structure so closely related to PCBs. In addition, the metabolites of chloralkylene may include hydroxylated biphenyl, whose introduction into the environment may be of greater concern than PCBs. EPA Office of Toxic Substances recommended against the use of chloralkylene in capacitors. None of the alternatives we are studying contain this fluid.

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Mr. Wirth also stated that his staff completed an environmental analysis of phthalate ester-based fluids for capacitors and found them to be acceptable. The analysis examined the same three parameters (toxicity, bioaccumulation, and biodegradability) that our office is using. A preliminary analysis of other substitutes, particularly McGraw-Edison/Dow Chemical's fluid, were found to be unacceptable and he cautioned against introduction of these fluids into the system. General Electric's and Sangamo's proposed substitutes are phthalate based while Westinghouse's and McGraw Edison's are isopropylbiphenyl and monochloro diphenyl respectively.

Robert Westin, Versar Inc., has been working very closely with EPA on the PCB problem and more specifically, on the proposed regulations for disposal of PCBs. These regulations should be published in the Federal Register Monday or Tuesday of next week. He also gave me the name of Ward Filgo, Tennessee Valley Authority, who is supposed to be one of the most knowledgeable people in the country on this problem and I will be contacting him next week.

I have standardized the toxicity tests the industries submitted on the four fluids and will be meeting next week with two EPA toxicologists to discuss the results. In addition, I spoke with Dr. S. Pavlou at the Univ. of Washington who has been doing considerable work on PCBs. He has developed a bioaccumulation model for PCBs. When I finish compiling information on the four fluids, we will meet to discuss the applicability of the model to simulate the bioaccumulation rates of non-PCB fluids. I will also meet with him to aid in my environmental analysis of the fluids.

Contacts with OSHA, NIOSH, FDA, members of the City Light's staff and others have been made in order to maximize the analysis.

This summarizes to date much of the work I have been doing on the problem of PCBs.

MO:ct

cc:  
O'Neill

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